



Town of

*Orleans*  
Massachusetts

# Orleans Water Quality Advisory Panel Stakeholder Workshop

## Floating Constructed Wetlands (FCW) Breakout Group

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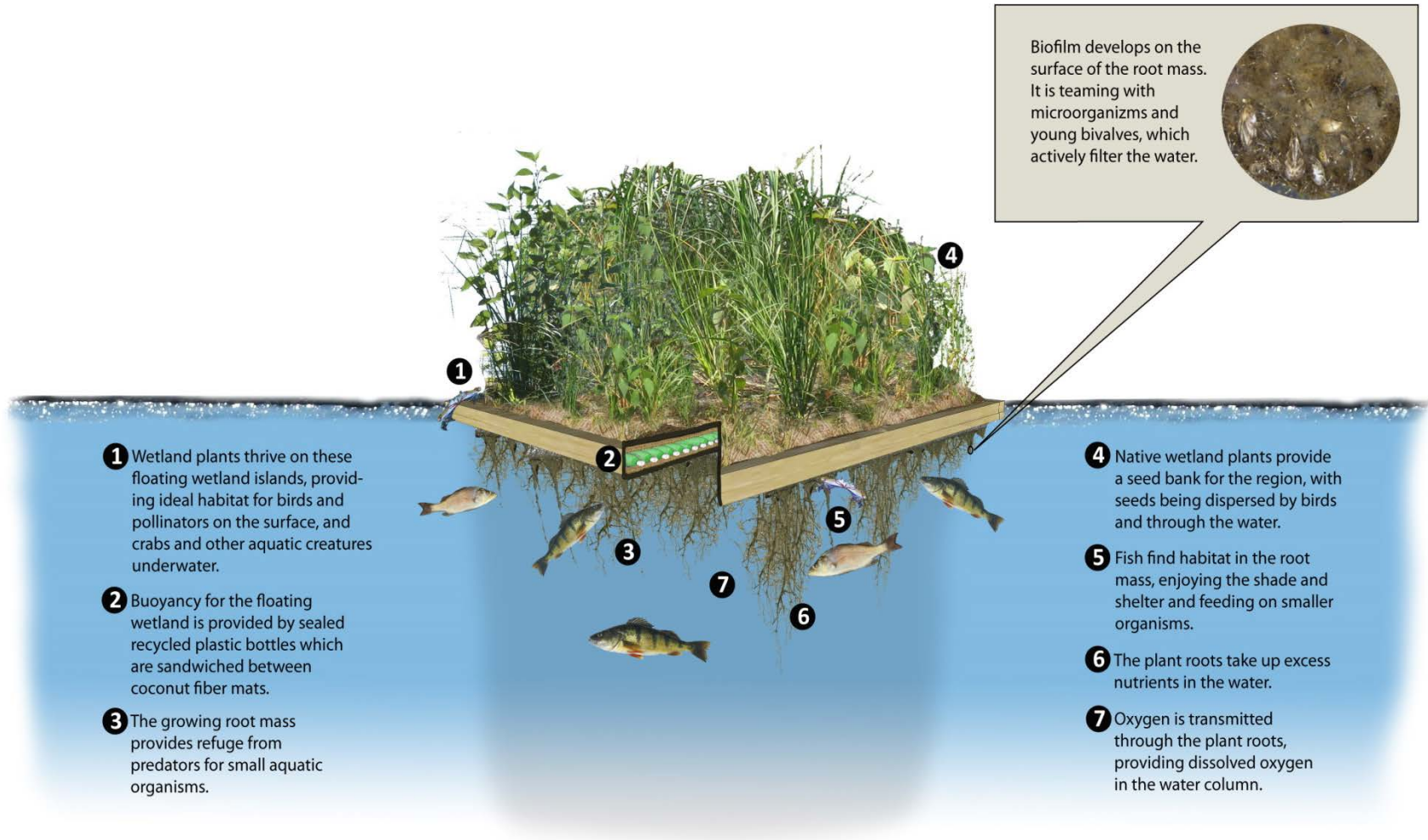
**AECOM**

# FCW Overview

- ❖ Constructed Rafts That Float on the Water's Surface
- ❖ Planted with Native Plants
- ❖ Provide Habitat and Surface Area for a Wide Range of Naturally-Occurring Attached Growth Microorganisms and Invertebrates.
- ❖ As Water Passes Through the System, Pollutants Can be Reduced
  - Nitrogen
  - Phosphorus
  - Biological Oxygen Demand
  - Total Suspended Solids
  - Fecal Coliform
- ❖ Denitrification is Key Pathway for Nitrogen Reductions



# FCW Schematic



# FCW Estuaries



**Jamaica Bay, New York**



**Baltimore Harbor, Maryland**



# Potomac Yard Stormwater Ponds, Alexandria, VA



# Objectives Statement for Demonstration Project

- ❖ Evaluate FCW Potential
  - Reduce Nutrients
  - Realize Associated Ecological and Socioeconomic Benefits
- ❖ Evaluate Uncertainties Associated with the Local Climate and Environmental Conditions
- ❖ Provide Data to Evaluate the Value of FCWs at Meeting the Long Term Goals of the Town of Orleans in Reducing Nitrogen in its Water Resources.



# FCW Demo and Full Scale Siting Evaluation Criteria

- ❖ Use Conflicts
- ❖ Utility/Infrastructure Conflicts
- ❖ Utility/Infrastructure Benefits
- ❖ Ease of Access
- ❖ Transferable Results
- ❖ Land Ownership
- ❖ Depth of Surface Water
- ❖ Overall Likelihood of Monitoring Plan to Yield Quantified Results



# FCW Locations Evaluated

- ❖ Lonnie's Pond
- ❖ Namequoit River
- ❖ Paw Wah Pond
- ❖ Pochet Neck
- ❖ Quanset Pond





# PRB Site Evaluation Matrix

Criteria	Lonnie's Pond		Namequoit River		Paw Wah Pond		Pochet Neck		Quanset Pond	
	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
<b>Site Suitability</b>										
Use Conflicts										
Utility/Infrastructure Conflicts										
Utility/Infrastructure Benefits										
Ease of Access										
Land Ownership										
Depth of Surface Water										
Quantifiable Results										
Regulatory Criteria										
<b>Total Criteria Points</b>										
<b>Rank</b>										

## ❖ Scoring

- A good ranking (1) was assigned if the criterion could be fully met.
- A neutral ranking (0) was assigned if the criterion could be met in part, but there were some potential issues and/or difficulties.
- A poor ranking (-1) was assigned if the criterion could not be met.



# FCW Site Preliminary Draft Ranking

Criteria	Lonnie's Pond		Namequoit River		Paw Wah Pond		Pochet Neck		Quanset Pond	
	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
<b>Site Suitability</b>										
Use Conflicts	1	1	0	0	0	0	0	0	1	1
Utility/Infrastructure Conflicts	0	0	0	0	0	0	0	0	0	0
Utility/Infrastructure Benefits	1	1	0	0	0	0	0	0	0	0
Ease of Access	1	1	-1	-1	1	1	-1	-1	1	1
Land Ownership	0	0	0	0	0	0	-1	0	0	0
Depth of Surface Water	1	1	1	1	0	0	1	1	1	1
Quantifiable Results	1	1	-1	-1	0	0	0	0	0	0
Regulatory Criteria	0	0	0	0	0	0	0	0	0	0
<b>Total Criteria Points</b>	<b>5</b>		<b>(1)</b>		<b>1</b>		<b>(1)</b>		<b>3</b>	
<b>Rank</b>	<b>1</b>		<b>4</b>		<b>3</b>		<b>4</b>		<b>2</b>	



# FCW Next Steps

- ❖ Review with Town
- ❖ Finalize Site Evaluation
- ❖ Complete Engineering Work Plan
- ❖ Develop Cost Estimates (Project, O&M, Replacement and Monitoring)
- ❖ Prepare Conceptual Drawings
- ❖ Prepare Preliminary Specifications
- ❖ Identify Monitoring Protocols
- ❖ Identify Maintenance Requirements
- ❖ Describe Regulatory Requirements





Thank You